A319/A320/A321
TECHNICAL TRAINING MANUAL
SA Family to A319/A320/A321 CFM LEAP - T1+T2
28-FUEL

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Fuel IDG Cooling System Presentation (CFM LEAP).....2

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FUEL IDG COOLING SYSTEM PRESENTATION (LEAP)

B2 SCOPE

CAUTION: MODULE TAGGED B2 SCOPE.
BE AWARE THAT ONLY AVIONICS/ELECTRICAL TOPICS SHOULD BE LEARNED FOR A T2 COURSE.

PRINCIPLE

The temperature of the Integrated Drive Generator (IDG) oil is decreased by fuel through a recirculation system. Some of the fuel that supplies the engines is used to decrease the temperature of the IDG oil. A Fuel Return Valve (FRV) lets the hot fuel return to the outer cell. The FRV opens the fuel flow back to the aircraft tank in special engine configurations (N2, fuel flow...). The FRV mixes the "hot fuel" flowing from the IDG fuel/oil heat exchanger and "cold fuel" from the Low Pressure (LP) fuel pump to keep the temperature of the returned fuel less than 100°C (212°F). The Fuel Level Sensing Control Unit (FLSCU) 1 and the Electronic Engine Controls (EEC A and B) control the recirculation system in the left wing. FLSCU 2 and EECs (A and B) control the right wing system.

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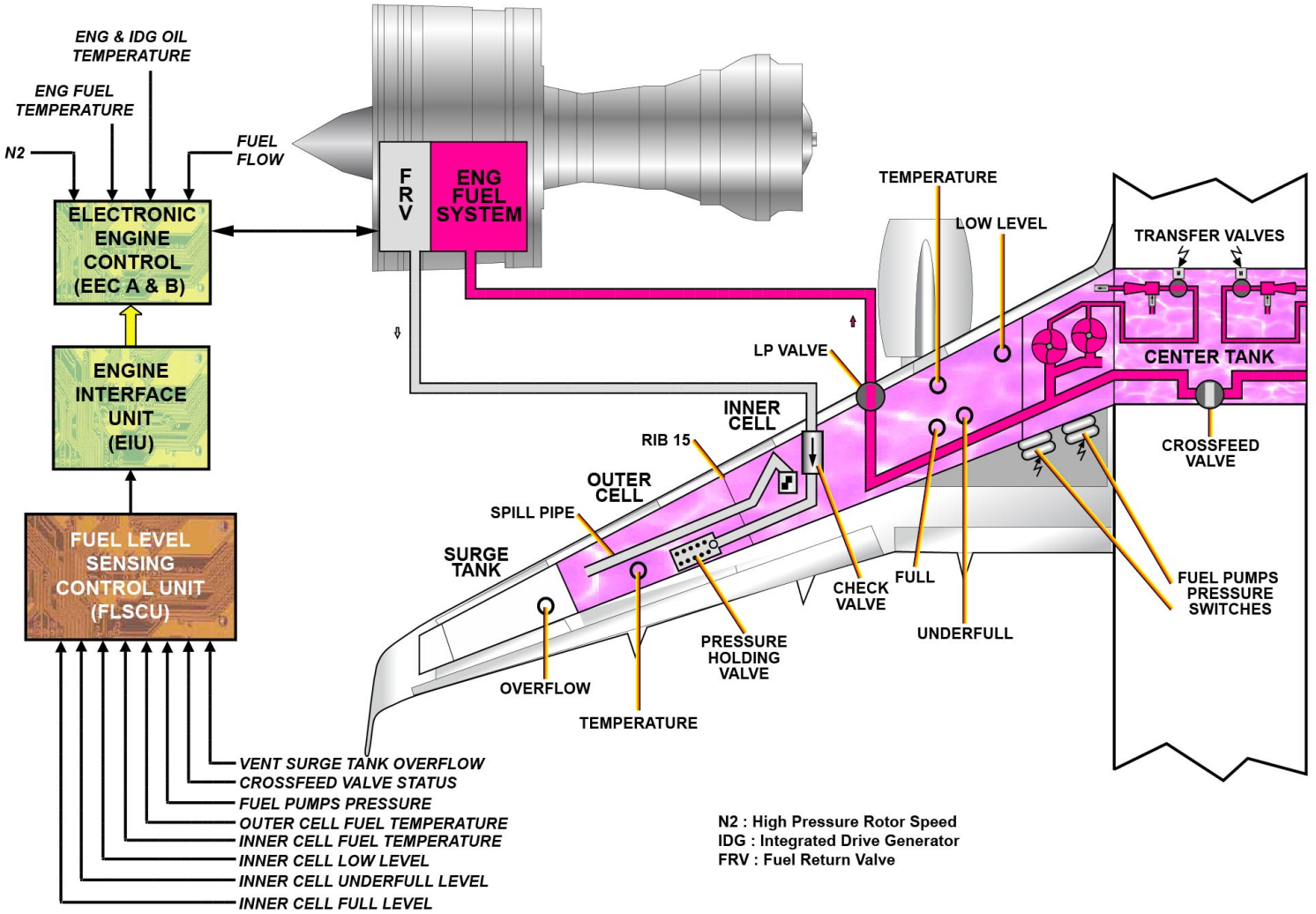

B2 SCOPE & PRINCIPLE

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FUEL IDG COOLING SYSTEM PRESENTATION (LEAP)

FUEL RETURN

The recirculated fuel is sent to the outer cell through a check valve and a pressure-holding valve to not let the fuel get to boiling temperature. The pressure-holding valve keeps a pressure of 15.5 psi in the return line. If the pressure increases, fuel bleeds through the valve into the outer cell. The check valve prevents fuel flow from the wing tank to the engine when the recirculation system is not in operation.

NOTE: Note: When the outer cell is full, the fuel overflows into the inner cell through a spill pipe.

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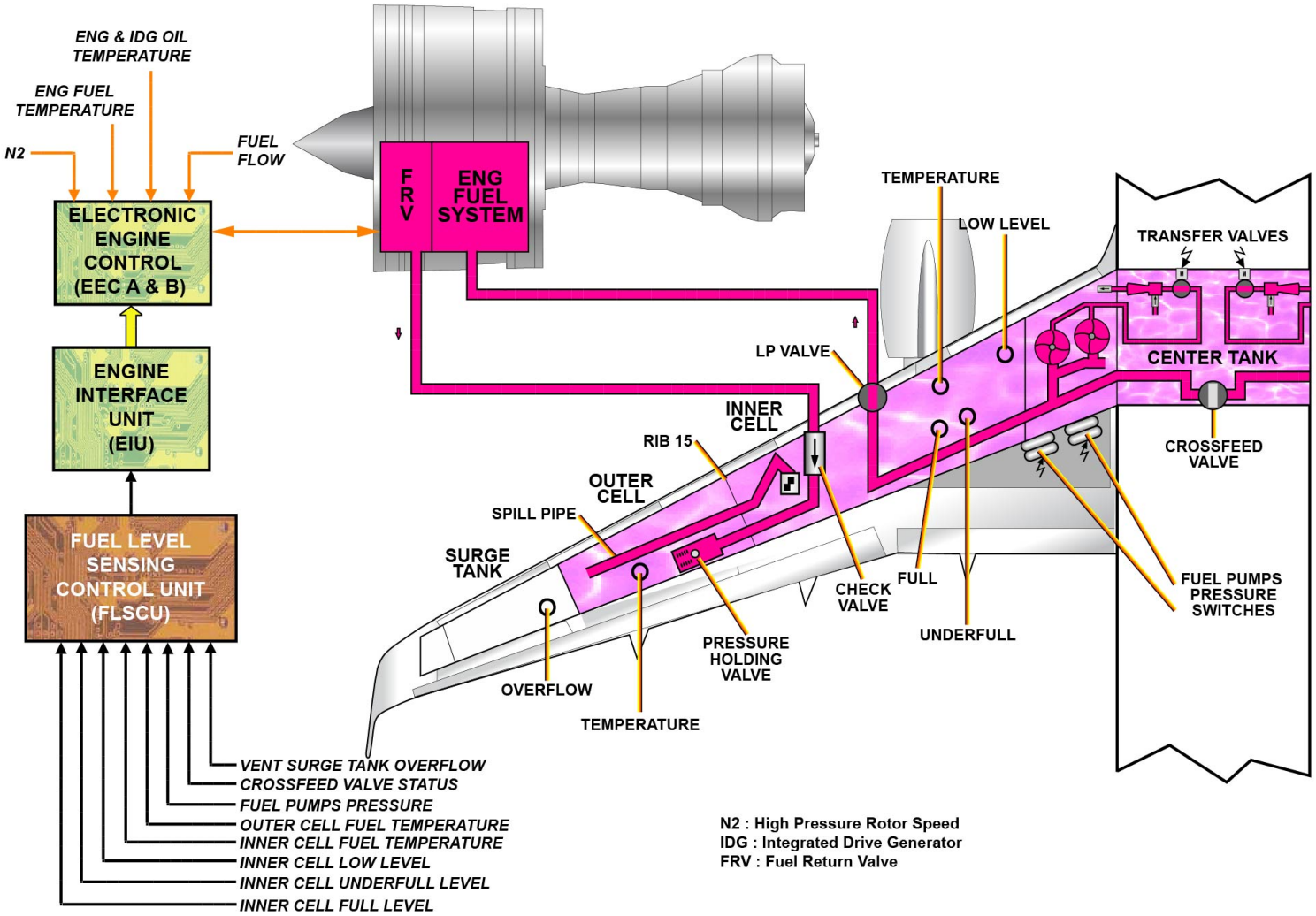

FUEL RETURN

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FUEL IDG COOLING SYSTEM PRESENTATION (LEAP)

PUMP LOGIC

While fuel is supplied from the center tank, the wing tanks will stay full and will possibly overfill because the returned fuel is supplied to the wing tanks. If this occurs, the center tank transfer valves close when the inner cell gets to the FULL level sensor. The wing tank pumps will supply the fuel to the engine until approximately 500 kg (1100 lbs) of fuel are used and the UNDERFULL sensor is reached. The logic circuit then open the center tank transfer valves again.

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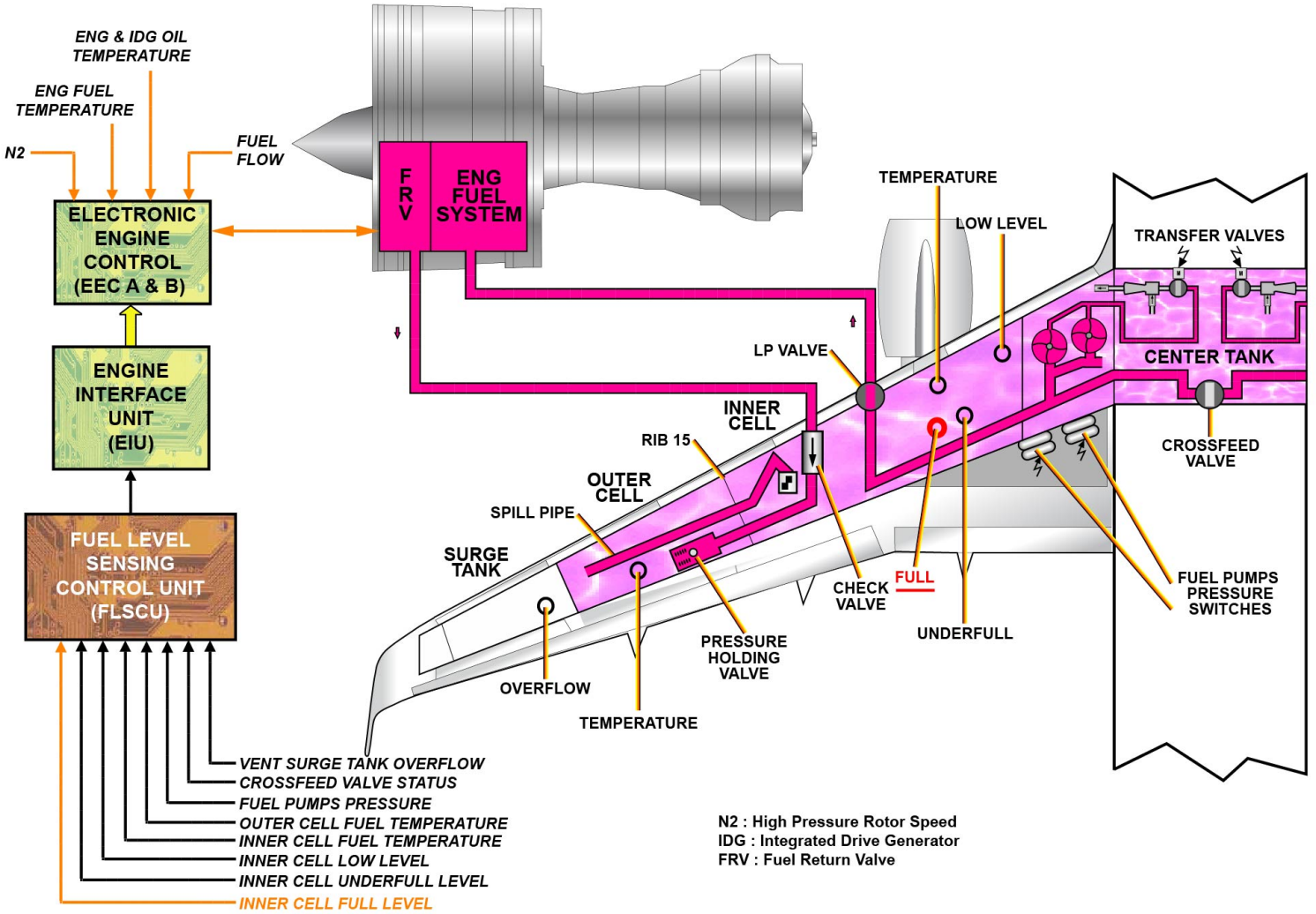

PUMP LOGIC

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FUEL IDG COOLING SYSTEM PRESENTATION (LEAP)

FUEL RETURN TO TANK VALVE CLOSURE

OVERFLOW

The FRV closes if the center tank transfer valves do not obey the logic signals of the full level sensors. This causes the wing tank to overflow through the tank ventilation system into the vent surge tank.
The overflow sensor sends an electrical signal to the FLSCU. The FLSCU sends a closure signal to the EECs through the Engine Interface Unit (EIU). The EECs close the FRV and stop the fuel supply back to the outer cell.

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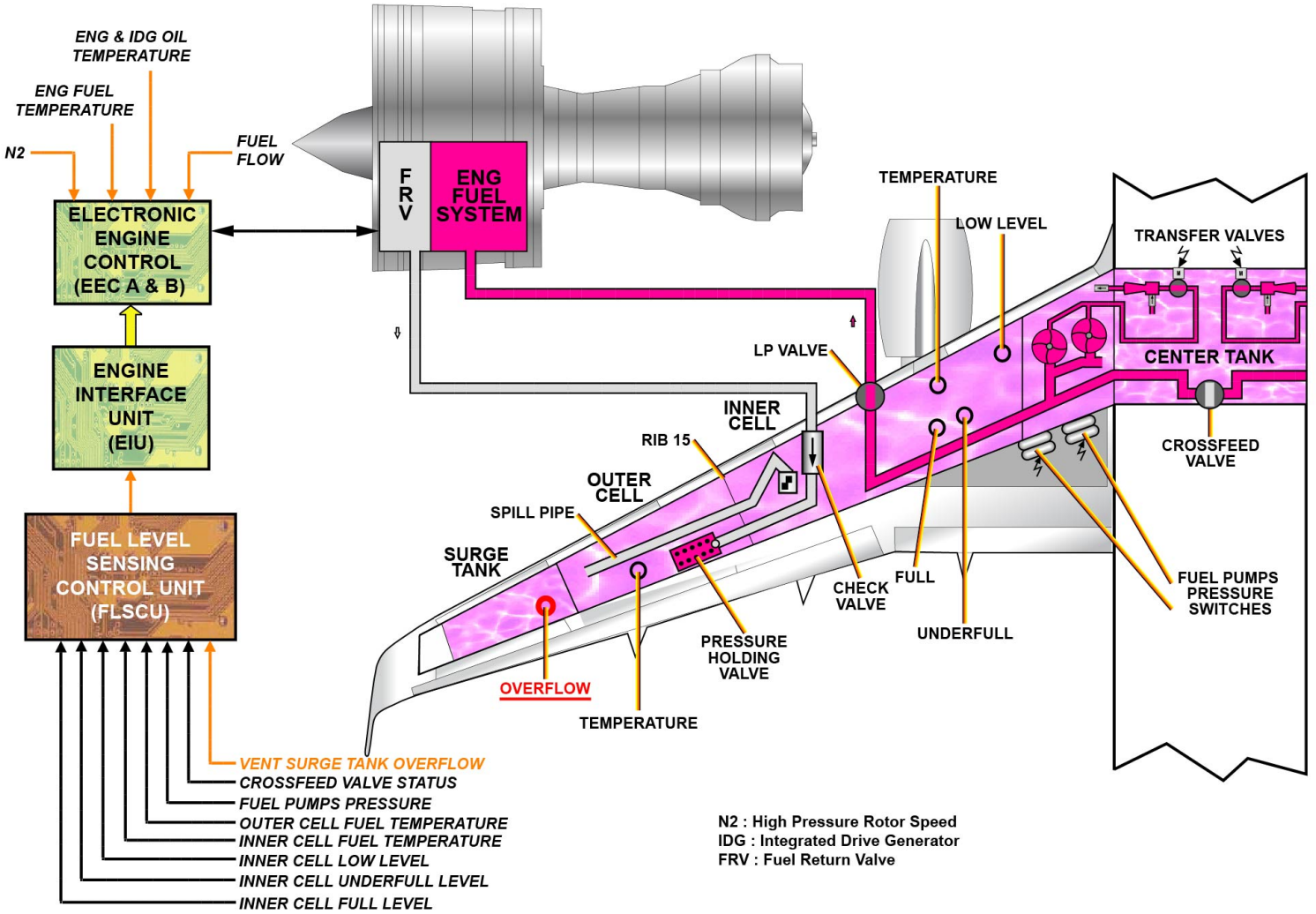

FUEL RETURN TO TANK VALVE CLOSURE - OVERFLOW

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FUEL IDG COOLING SYSTEM PRESENTATION (LEAP)

FUEL RETURN TO TANK VALVE CLOSURE (continued)

OUTER CELL HIGH TEMPERATURE

The FRV closes if the fuel temperature is too high in the outer cell, i.e. 52.5°C (126.5°F). Because the returned fuel from the engine is hot, the FLSCU prevents an overtemperature in the wing tanks. The FLSCU sends a closure signal to the EECs through the EIU. The EECs close the FRV and stop the fuel supply back to the outer cell.

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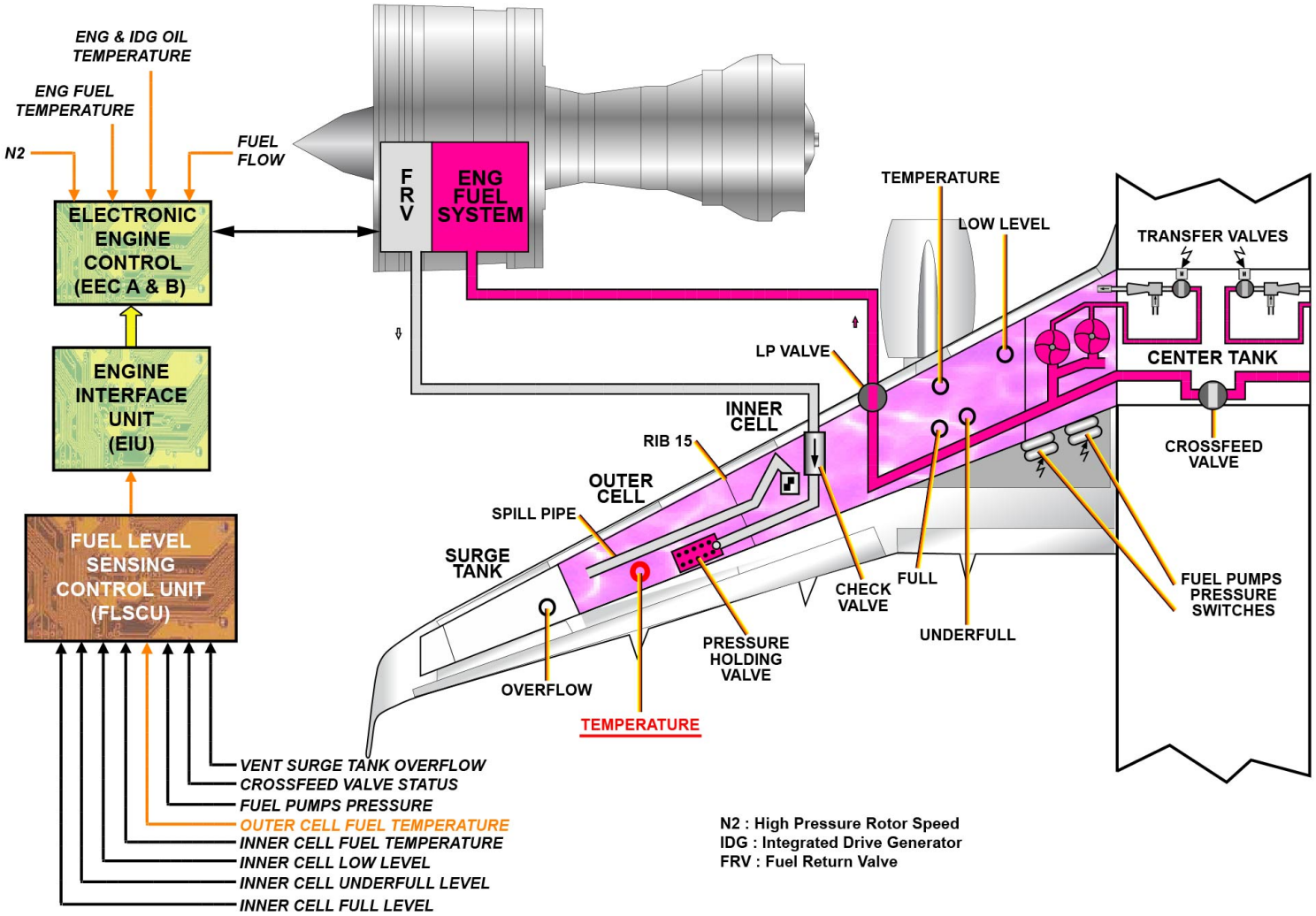

FUEL RETURN TO TANK VALVE CLOSURE - OUTER CELL HIGH TEMPERATURE

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FUEL IDG COOLING SYSTEM PRESENTATION (LEAP)

FUEL RETURN TO TANK VALVE CLOSURE (continued)

INNER CELL HIGH TEMPERATURE

The FRV closes if the fuel temperature in the inner cell is too high, i.e. 55°C (131°F). Thus a large volume of high-temperature fuel will not go into the inner cell if the intercell valve opens. This also keeps the fuel temperature at an acceptable level if a tank rupture occurs.

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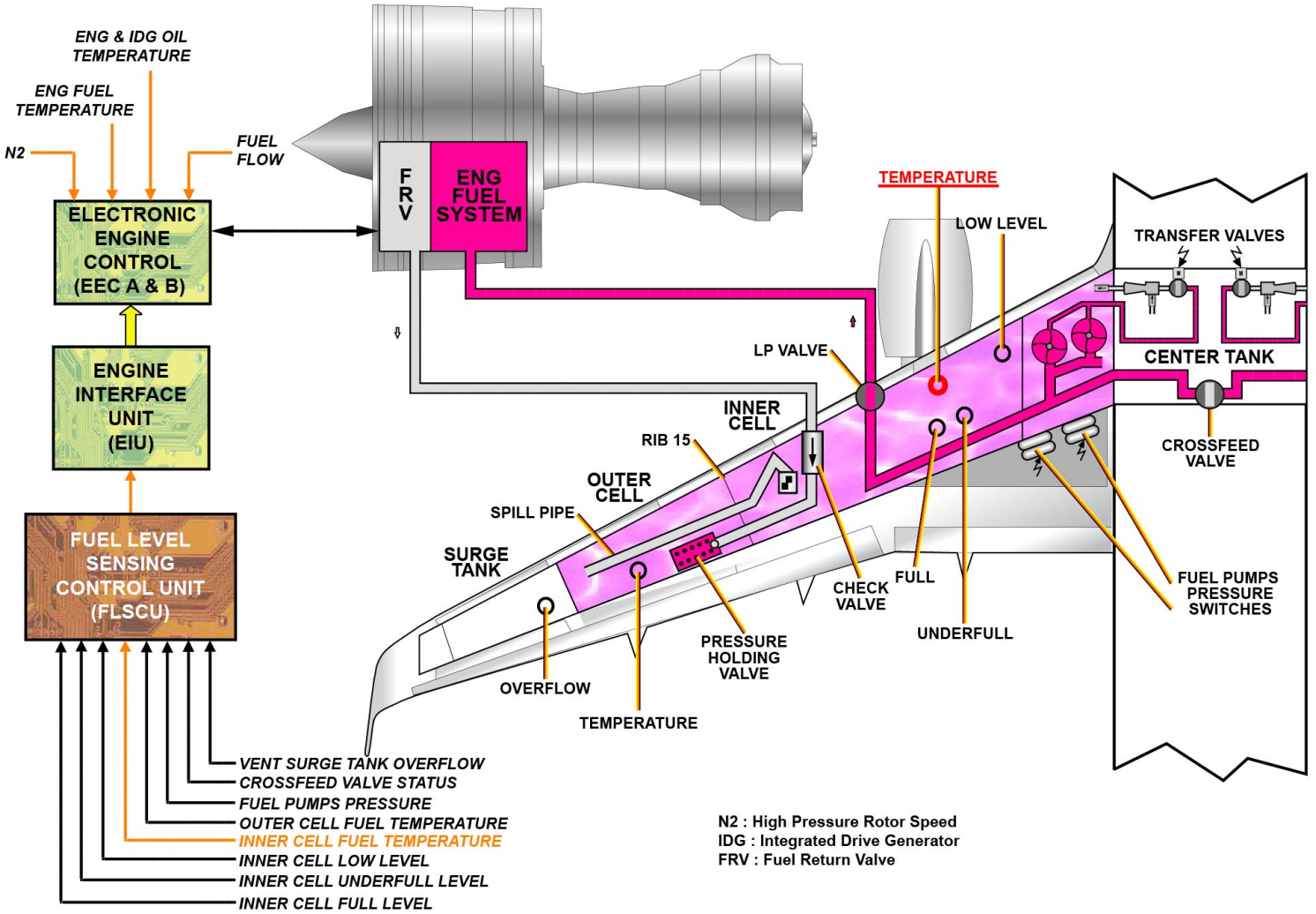

FUEL RETURN TO TANK VALVE CLOSURE - INNER CELL HIGH TEMPERATURE

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FUEL IDG COOLING SYSTEM PRESENTATION (LEAP)

FUEL RETURN TO TANK VALVE CLOSURE (continued)

PUMP PRESSURE LOSS

The FRV closes if a fuel pump Low Pressure (LP) is sensed by all pump pressure switches of one wing for the related engine when the crossfeed valve is closed, or if a fuel pump LP is sensed by all pump pressure switches of the two wings when the crossfeed valve is open. This is to stop the return fuel flow during engine gravity feeding. LP is sensed by the pump LP switch and a signal is sent to the FLSCU.

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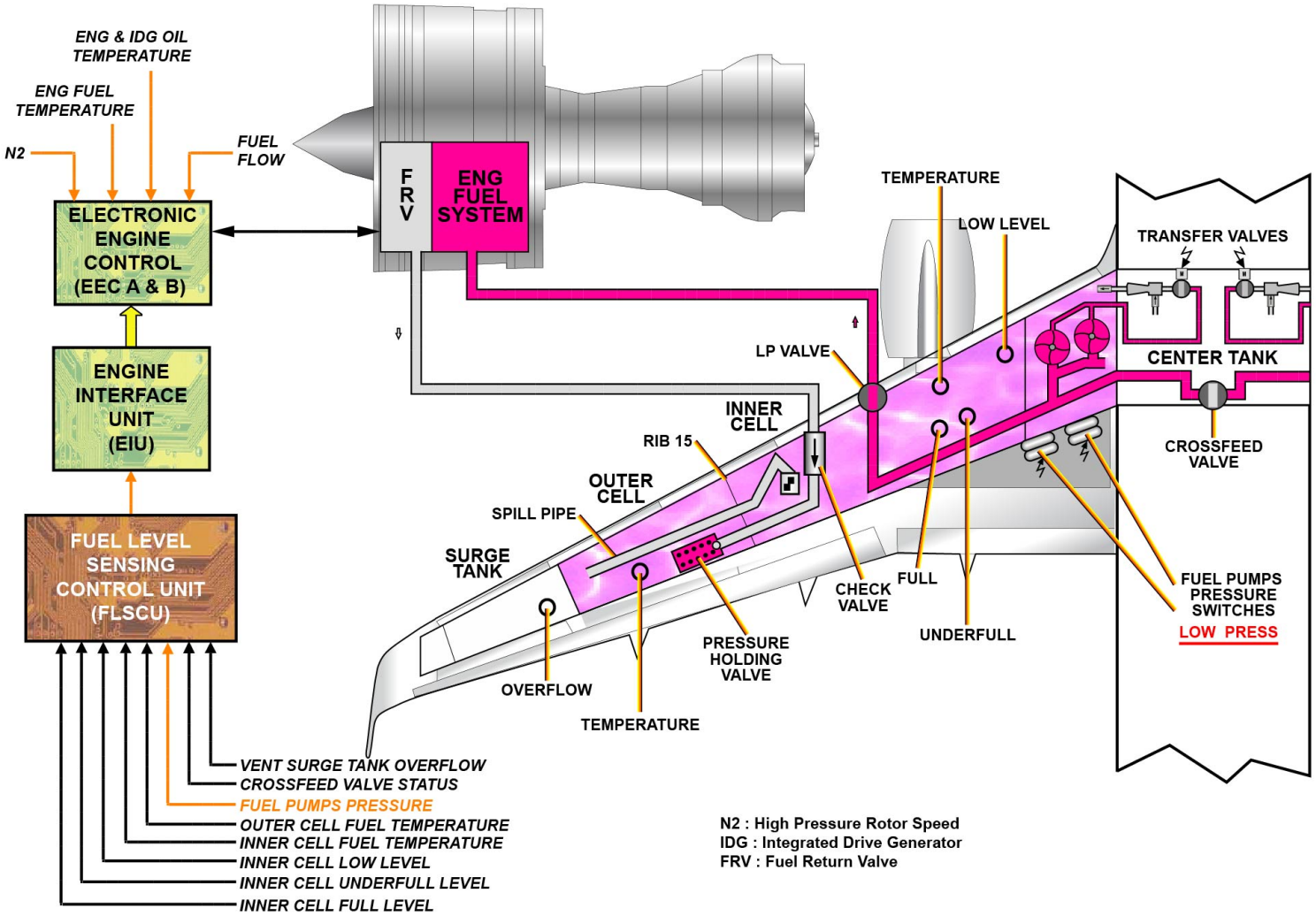

FUEL RETURN TO TANK VALVE CLOSURE - PUMP PRESSURE LOSS

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FUEL IDG COOLING SYSTEM PRESENTATION (LEAP)

FUEL RETURN TO TANK VALVE CLOSURE (continued)

LOW LEVEL

The FRV closes when the fuel level in the inner cell decreases to the INNER LOW LEVEL sensor at 280 kg (620 lbs).

NOTE: Note: When the FRV closes, this decreases the quantity of fuel that cannot be used.

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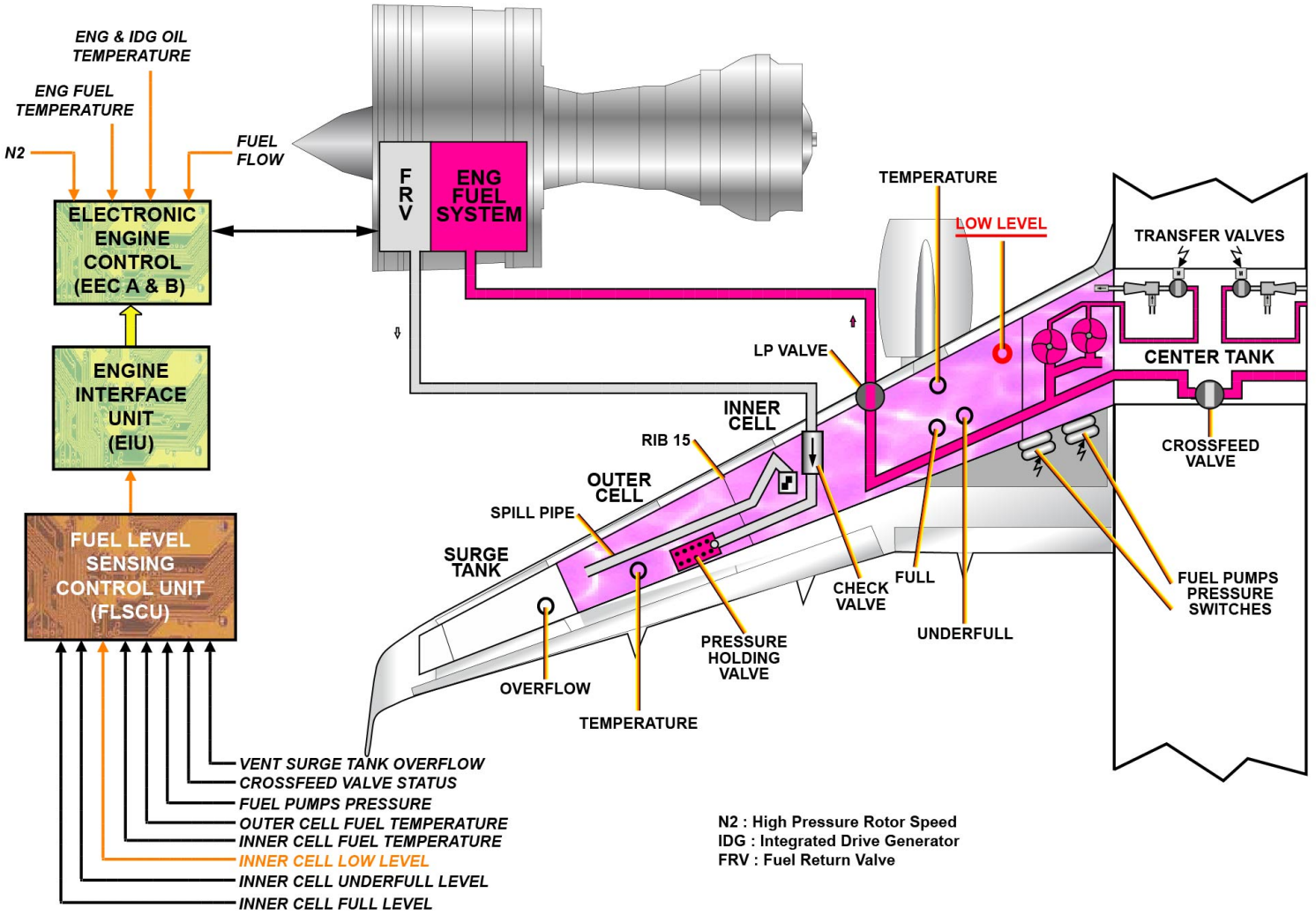

FUEL RETURN TO TANK VALVE CLOSURE - LOW LEVEL

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